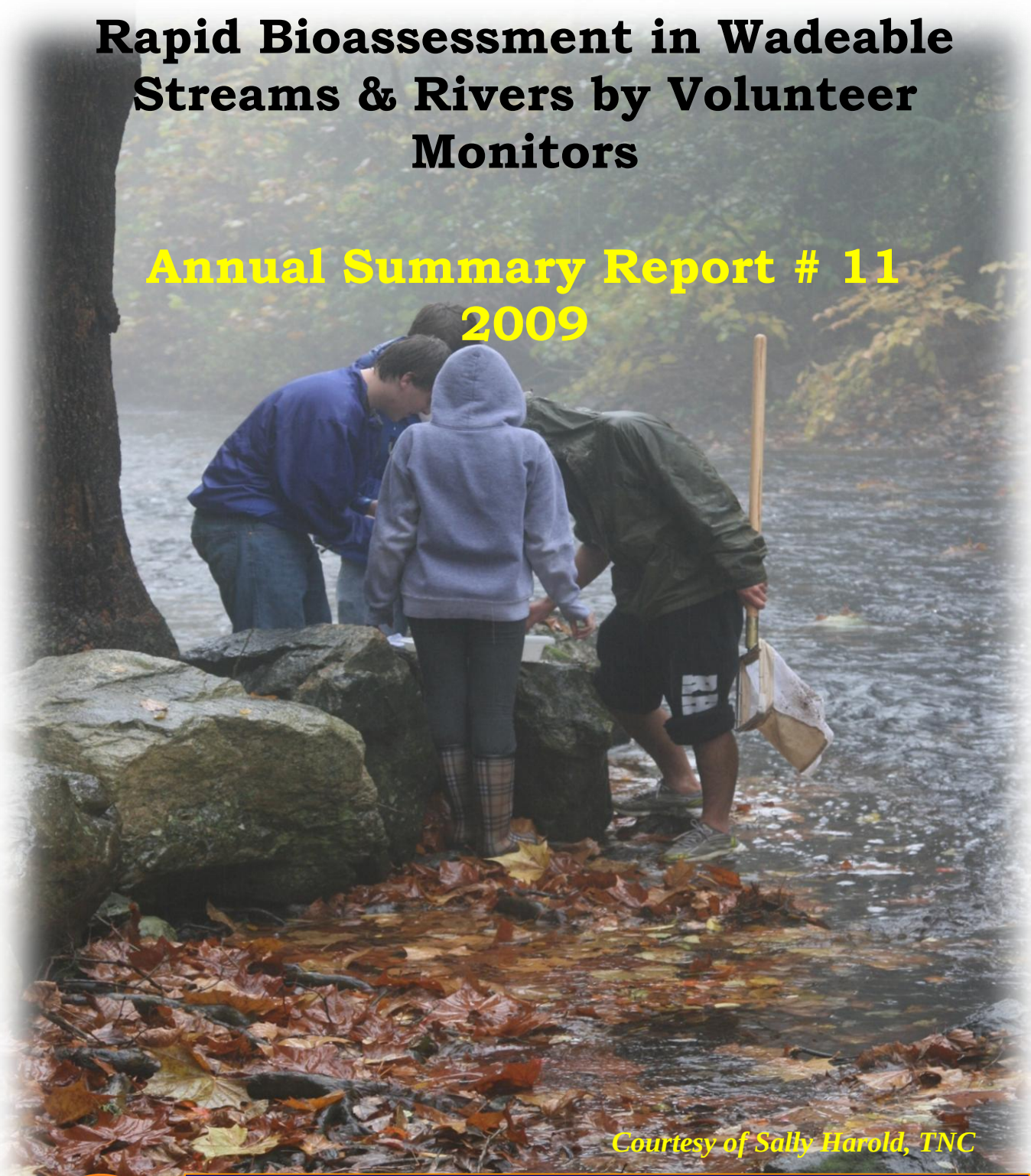
Rapid Bioassessment in Wadeable Streams & Rivers by Volunteer Monitors

Annual Summary Report # 11
2009



Courtesy of Sally Harold, TNC

State of Connecticut
Department of Environmental Protection
Bureau of Water Protection & Land Reuse
Amey Marrella, Commissioner

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COVER: Weather, what weather? These dedicated students participating in The Nature Conservancy-Devil's Den work on finding as many "Most Wanted" types as they can. As luck would have it just as the groups entered the streams on this date, the skies opened up! Thanks for hanging in there! Thanks to Sally Harold for sending in the winning photo.

Executive Summary

The Rapid Bioassessment in Wadeable Streams and Rivers by Volunteer Monitors program (RBV) is a macroinvertebrate collection protocol developed by the Connecticut Department of Environmental Protection, Bureau of Water Protection and Land Reuse, Ambient Monitoring Program (herein referred to as WPLR). The goal of RBV is to provide volunteer monitoring programs with a quick, efficient, and standardized methodology for the collection of macroinvertebrate community data from wadeable streams. This data can be used to screen for either very good or very poor water quality and augment monitoring conducted by WPLR. All support materials including a more detailed description of the program, the RBV methodology, data sheets, sorting guides, macroinvertebrate cards, informational brochure, and annual summary reports are available on the DEP volunteer monitoring web page (www.ct.gov/dep/rbv). To obtain additional information about RBV or to become involved, please contact Mike Beauchene, volunteer monitoring coordinator, by phone (860) 424-4185 or email mike.beauchene@ct.gov

2009 PARTICIPATION STATISTICS:

Number of monitoring locations (Appendix A)	**113**
Number of samples collected	**121**
Number of waterbodies monitored	**76**
Number of fall samples > or = 4 "Most Wanted" types	**32**
Number of individual participants	**400+**
Number of groups participating in 2009	**22**
Number of groups participating for the first time	**6**
Number of groups returning for another year	**16**

WPLR would like to thank all of the participants who collected RBV data under the sponsorship of the following groups and individuals:

Central Connecticut State University-Geography, **Connecticut Audubon Society at Pomfret Citizen Science Program, Julie Blum, Bolton Conservation Commission, East Lyme Conservation Commission, Salvatore DiCarli, Farmington River Watershed Association, Friends of Hammonasset River, Friends of the Hockanum River Linear Park, Housatonic Valley Association (Roxbury Conservation Commission, Shepaug Group, Housatonic Valley Regional School), John and Luca Imbimbo, Nature Conservancy-Devils Den, New Fairfield Conservation Commission, Park River Assessment Program, Paul Brenard, Pomperaug River Watershed Coalition, Quinebaug/Shetucket Heritage Corridor Last Green Valley Water Quality Monitoring Program, Salmon Brook Watershed Association, Three Rivers Community Technical College, Trout Unlimited-Candlewood Valley Chapter, and Westover School.**

The RBV Program

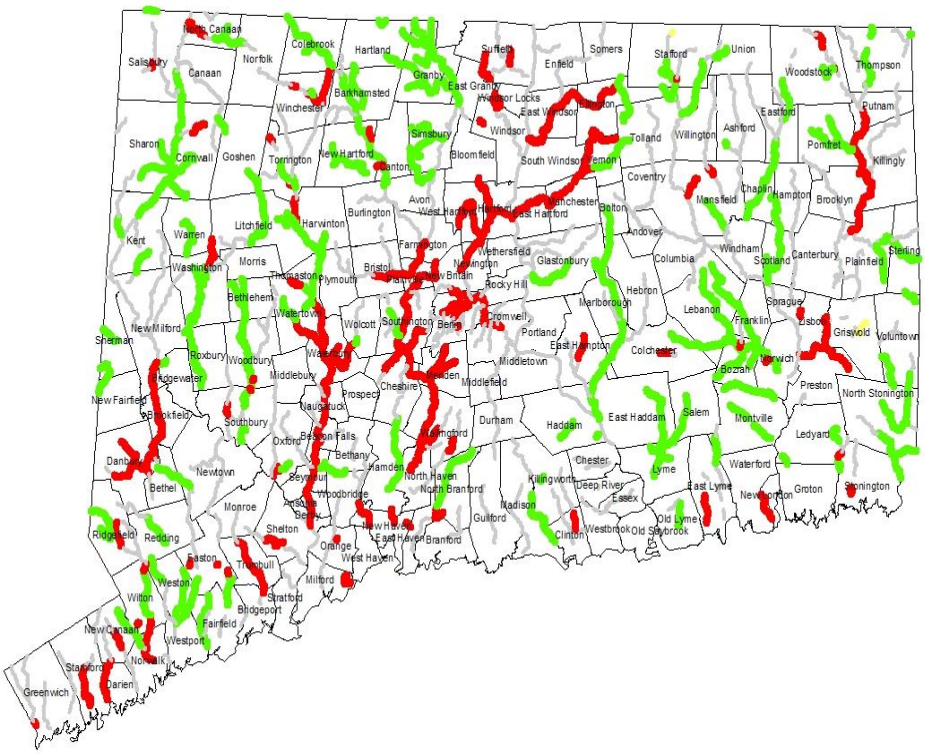
The RBV protocol includes 33 macroinvertebrate taxa, each with distinct shape, structure, color, or behavior (Appendix B). In order for an organism to make the RBV list each must meet 3 criteria; first the organism should have a statewide distribution, second the organism should provide key information about the river system, and third the organism has a unique behavior or morphological characteristic easily observed by first time participants. Each of these organisms has been placed into 1 of 4 categories ***most wanted*** (panels 1-8b) consists of macroinvertebrates typically found in streams characterized by outstanding water quality. ***Moderately wanted*** (panels 9-14) are those found in a range of conditions from outstanding to good water quality. ***Least wanted*** (panels 15a-g) consists of those found in all types of water quality conditions, from outstanding to poor. *Others* (no panels have been developed) represent organisms that can be very common but do not provide enough information to be included in the RBV method. The "other" category of organisms was added to the RBV program starting in 2005 based on suggestions from RBV participants. Detailed information about each organism can be found on the field identification panels. The panels are available on the DEP web page at (RBV Macroinvertebrate Cards). The name of each of the 3 qualitative categories is intended to characterize water quality and is not intended to imply that those in the least wanted category are harmful or result in nuisance conditions. No organism included in the RBV protocol has higher or lower ecological value than any other.

The RBV Method

The RBV method is based upon the Rapid Bioassessment Protocols developed by the US EPA and implemented by DEP ambient monitoring staff (Barbour et al 1999, Plafkin et al 1989). The RBV protocol requires that the participants sample the macroinvertebrate community from a stream riffle habitat and produce a voucher collection accompanied by a data sheet (Appendix B). A voucher collection is produced by placing at least one specimen of each type of organism collected into a leak-proof container with a descriptive label and isopropyl alcohol. The data sheet documents the different organisms present at the site as well as the relative abundance of each in the sample. Both the voucher sample and the data sheet are submitted to WPLR. The contents of the vial are verified against the field data sheet and then entered into a Microsoft Access database. It is important to note that the final data for the sample is based upon the voucher collection and not what has been recorded on the data sheet. If an organism is listed on the data sheet but not present in the voucher collection, it does not count.

The RBV program occurs annually in the fall and takes approximately 2 hours to complete at the monitoring site. Prior to collecting the macroinvertebrates most participants attended a 3-hour training session in which the WPLR volunteer monitoring coordinator describes the program and introduces the participants to the RBV methodology. WPLR has 20 sets of equipment available for short-term loan to participants. Those groups that have participated for at least 2 years and feel confident with the methodology may opt to forgo the official WPLR training session and simply borrow the equipment.

Biological data use: The primary use of macroinvertebrate data by WPLR is to compare the community structure to narrative biological criteria described in the current water quality standards. This process is described in the Consolidated Assessment and Listing Methodology (CT CALM 2009). This comparison can provide an assessment of the degree of impairment and therefore the degree to which water quality standards are supported (CT 305(b) 2009). The figure below represents the aquatic life use support assessments reported in the 2006 Water Quality Report to Congress (CT 305(b) 2009).



Additional information regarding CALM and the 305(b) report can be found on the DEP web site and links are provided at the end of this report.

Data collected according to the RBV protocol can be used as a screening tool to identify stream sections with either very high or very low water quality. The documentation (voucher collection) of key indicator organisms (the most wanted) in a section of a stream provides a record of the benthic community present for a collection date and time. However, the absence of such indicators in any sample does not automatically mean the water quality is low, but rather further information may be required. In some situations current WPLR protocol may be necessary to definitively assess water quality. It is important to note that the "least wanted" are able to thrive in many environmental conditions while the "most wanted" thrive only under conditions of low environmental stress. Therefore the most definitive RBV data are the collections with good representation of organisms in the "most wanted" category.

For those samples with 4 or more types of organisms in the "most wanted" category WPLR's monitoring staff is confident the location fully supports the state water quality standard for aquatic life (CT WQS 1997). Samples with 3 or fewer types in the "most wanted" category do not definitively indicate impairment or water quality degradation. In these situations additional review is conducted by WPLR to determine the particular species present, land use characteristics upstream of the monitoring location, and the potential for sampling/methodology errors.

RBV limitations

The RBV method was developed to be a simple, non-technical, and enjoyable method for use by citizens interested in evaluating the water quality of a local resource while concurrently generating useful information for WPLR. To date the program has been successful at meeting both objectives. However, to accomplish these, the RBV method requires the participant preserve at least one of each different type of organism present. The final list of organisms in a sample is based on WPLR review of the datasheet against the organisms present in the voucher collection. If the organism is not in the voucher but recorded on the datasheet, it is not counted as part of the sample, even if the organism was actually present. Successful implementation of the RBV method is dependent upon an adequate collection of a sample from a riffle habitat, sorting organisms to find all of the different types present, and most importantly placing 1of each into a leak-proof container with alcohol and a label. It is not dependent upon accurate identification by the participant. Any variable (site selection, incomplete collection, high stream flow, inclement weather conditions, nuisance insects, rushed time constraints, or rotted/desiccated voucher specimens) that reduces the quality or completeness of any step in the RBV method may ultimately reduce the number of different types found. As a result, errors made will tend to underestimate the macroinvertebrate community present and may overestimate water quality degradation. To insure that each organism present at a site is documented, it is critical that at least one of each different type of organism is placed in the voucher collection. In most situations sampling by WPLR using the current WPLR protocol will be necessary to definitively assess water quality.

TO BECOME INVOLVED

A daylong training/data collection workshop can be held for your organization free of charge*. The workshop is structured around instructional power-point presentations in the morning and data collection in the afternoon.

The data collection process is completed on site at a riffle (fast flowing rocky bottom). Participants wade into the water, dislodge the organisms into a net by scrubbing the rocks, sort and identify the different organisms present, and preserve a representative set of organisms for verification. At the completion of the session the data is submitted to the CT DEP for incorporation into water quality assessments.

RBV workshops are scheduled on a first come first serve basis with priority for first time programs. Since the data collection occurs in the fall and there are a fixed number of weekend days, it is better to schedule well in advance. Every attempt will be made to accommodate each workshop request. WPLR will provide all of the necessary equipment **except for waders, hip boots or other waterproof foot ware**.

TO BECOME INVOLVED*:
The prerequisites to sponsor a workshop are to:

1.) Assemble a group of at least 6 adults
2.) Reserve a meeting room centrally located to the potential monitoring stations. The room must have electricity and be capable of holding all of the participants.
3.) Contact Mike Beauchene to schedule a workshop date by phone (860) 424-4185 or email at mike.beauchene@ct.gov

*Individuals not associated with a monitoring program can be linked with a program in their local area.

2009 RBV Summary:

2009 marked the 11th year citizen groups collected and submitted samples to WPLR under the RBV program. Approximately 400 participants collected a record 121 (108 fall and 13 spring) samples (Figure 1).

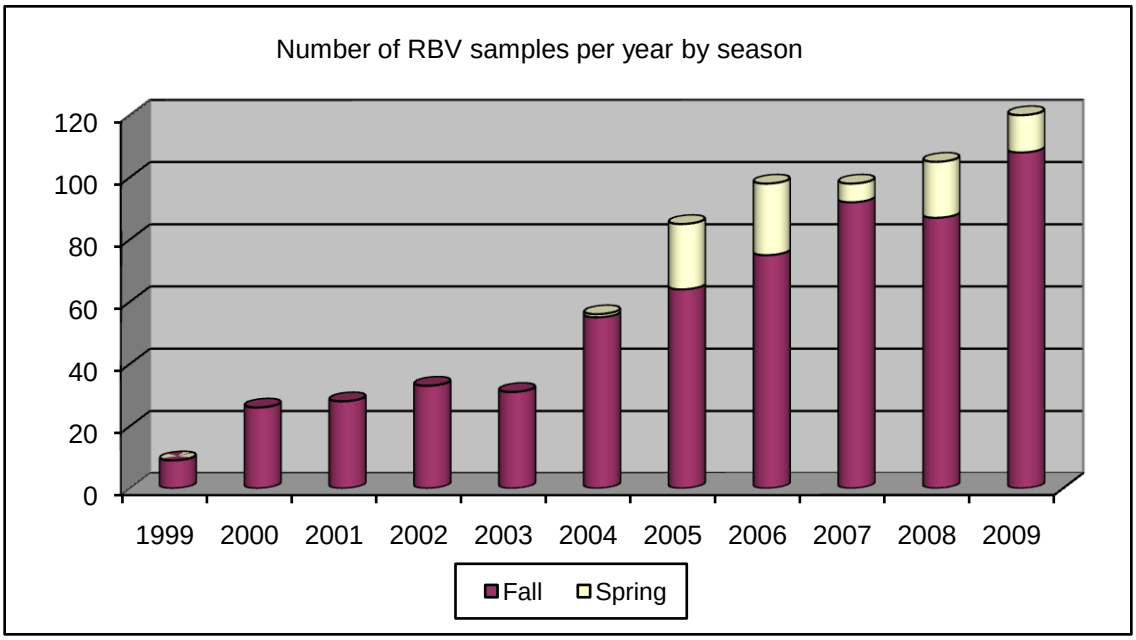


Figure 1. The number of RBV samples collected and submitted to WPLR by RBV participants. The number of samples has grown 5 fold since the program inception.

Locations: Twenty-two citizen groups collected 121 samples from 113 locations on 76 different waterbodies during 2009 (Figure 2). A description of each sample location is provided in Appendix A.

Table 1 is a list of each RBV organism present in each of the voucher collections submitted to DEP for 2009. The entries in the table are sorted alphabetically by stream name and basin number and then by greatest number of "most wanted" types to least. Each row is a sample as described by the stream name, collection date, basin id and site number. The number at the top of each column in the table corresponds to the panel number on the RBV datasheet and RBV identification materials. Panels 1-8b are in the most wanted category, 9-14 in the moderately wanted category, and panel 15a-15g are in the least wanted category.

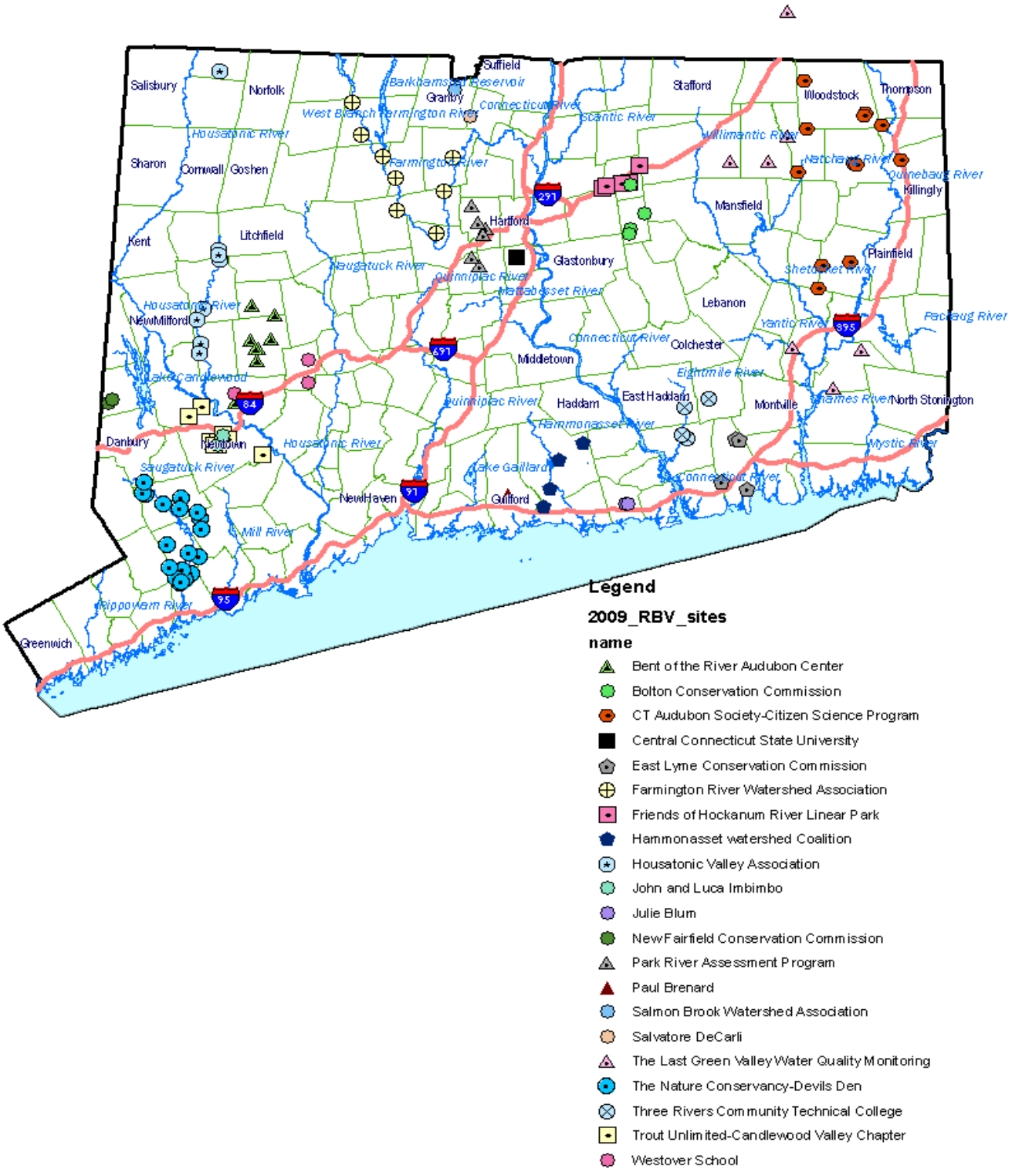


Figure 2. The 113 sample collection locations during 2009 and the entity responsible for each collection. A description of each of the locations can be found in Appendix A.

Table 1. The organisms present in each of the 121 voucher collections submitted to WPLR during 2009. The samples are sorted alphabetically by stream name and basin number and then descending by the greatest number of most wanted types present in a voucher. The panel number corresponds to the RBV datasheet, identification cards, and sorting guide. Of the 121 samples collected, only those with 4 or more total most wanted from a fall sample date (Blue background) are used to indicate full support of aquatic life use goals.

				most wanted													moderately wanted								least wanted							
Stream	station id	date	Municipality	1	2	3	4	5A	5B	5C	6A	6B	7	8A	8B	total	9	10	11	12	13A	13B	14	total	15A	15B	15C	15D	15E	15F	15G	total
Aspetuck River	1	10/24/09	Westport		x											1	x	x	x		x	x	x	6					x			1
Aspetuck River	1299	10/24/09	Westport		x											1	x		x					2								
Aspetuck River	2479	10/24/09	Fairfield		x			x								2		x	x	x		x	x	5								
Aspetuck River	2480	10/25/09	Easton		x			x			x					3		x	x	x		x	x	5				x				1
Aspetuck River	2481	10/25/09	Easton		x			x						x		3		x	x	x		x	x	5								
Aspetuck River	2482	10/25/09	Easton		x			x								2			x	x		x	x	4				x			x	2
Ball Pond Brook	5930	5/2/09	New Fairfield													0	x	x					x	3			x	x	x	x	x	5
Ball Pond Brook	5931	5/2/09	New Fairfield							x			x			2	x	x	x			x	x	5				x	x		x	3
Ball Pond Brook	1096	5/16/09	New Fairfield							X						1	X	X					X	3	X				X			2
Bass Brook	2662	9/12/09	Newington													0	x	x		x				3			x					1
Bass Brook	5945	9/12/09	New Britain					x								1	x	x		x				3			x					1
Beaver Brook	1236	4/25/09	Lyme		x			x			x					3			x	x		x	x	4				x			x	2
Beaver Brook	1236	10/31/09	Lyme					x			x			x		3	x	x	x	x		x	x	6								
Bigelow Brook	5066	10/22/09	Eastford		x			x								2			x	x	x	x	x	5								
Blackberry River	5961	11/2/09	North Canaan	x	x			x			x		x			5	x	x	x	x		x	x	6		x						1
Blackledge River	1248	11/8/09	Bolton													0	x	x				x	x	4								
Bolton Pond Brook	2486	11/8/09	Bolton							x						1		x	x					2								
Bradley Brook	6067	10/25/09	Middlebury							x				x	x	3	x		x	x		x	x	5				x	x	x		3
Broad Brook	1841	10/10/09	Preston		x			x						x		3			x		x	x	x	4	x			x				2
Bunnell Brook	2266	9/12/09	Burlington					x			x					2	x	x	x					3							x	1
Burnhams Brook	1239	4/25/09	East Haddam							x			x			2		x						1		x		x				2

Burnhams Brook	1239	10/31/09	East Haddam					x						x	x	3		x	x					2							
Chatfield Hollow Brook	1998	9/5/09	Killingworth		x			x								2		x	x			x	x	4					x		x	2
Cherry Brook	1513	9/26/09	Canton		x					x	x		x			4		x	x	x		x	x	5					x		x	2
Cranberry Meadow Brook	5153	9/19/09	East Lyme				x	x			x		x			4	x	x	x	x		x	x	6	x			x	x			3
Deep Brook	47	4/16/09	Newtown								x		x			2		x	x	x				3				x			x	2
Deep Brook	47	10/16/09	Newtown					x			x	x	x			4	x	x	x	x				4	x						x	2
Deep Brook	1992	10/28/09	Newtown		x			x								2	x	x	x	x		x		5				x				1
Deep Brook	1993	10/16/09	Newtown										x			1	x	x	x			x		4								
Deep Brook	2280	4/16/09	Newtown								x		x			2			x			x		2								
Deep Brook	2280	11/8/09	Newtown													0	x	x	x	x		x	x	6				x				1
Deep Brook	2473	10/28/09	Newtown													0		x	x	x				3				x				1
East Branch Salmon Brook	2454	10/10/09	Granby		x			x	x		x	x		x		6	x	x	x	x		x	x	6								
East Spring Brook	5932	9/30/09	Bethlehem					x			x		x			3	x	x	x			x		4					x		x	2
Fenton River	74	11/16/09	Willington		x			x	x							3		x	x			x		3								
Fivemile River	2462	10/2/09	Killingly		x			x								2	x	x	x	x	x		x	6							x	1
Folly brook	6070	11/2/09	Wethersfield													0							x	1		x	x			x		3
Fourmile River	5933	9/19/09	East Lyme					x						x	x	3	x	x	x			x	x	5	x				x			2
French Brook	1534	11/8/09	Bolton				x	x		x			x			4	x	x				x	x	4								
Gages Brook	1240	10/10/09	Tolland					x			x		x			3	x	x	x	x		x	x	6				x		x	x	3
Halfway River	2762	11/8/09	Newtown					x	x		x	x				4	x		x	x		x	x	5								
Hammonasset River	96	9/5/09	Madison		x	x		x					x			4	x	x	x			x	x	5								
Harris Brook	1237	4/25/09	Salem	x	x	x		x		x			x			6	x	x	x			x		4				x		x		2
Harris Brook	1237	10/31/09	Salem		x			x					x			3		x			x	x	x	4								
Heft Brook	5934	9/5/09	Killingworth										x	x		2	x		x			x	x	4								
Hop Brook	1015	9/12/09	Simsbury					x								1	x	x	x	x				4							x	1
Hop Brook	2470	10/10/09	Middlebury		x			x								2	x	x	x	x		x		5					x			1
Kitt Brook	1967	10/31/09	Canterbury													0	x	x	x	x		x		5	x	x				x	x	4
Latimer Brook	5935	9/19/09	East Lyme					x			x					2	x	x	x	x		x	x	6								
Lebanon Brook	2272	10/30/09	Woodstock					x					x			2	x	x	x	x			x	5								

Little River	1063	10/9/09	Putnam		x			x			x				x	4	x	x		x	x	x		5							x	1
Little River	1655	10/10/09	Canterbury		x			x			x		x	x		5	x	x		x		x	x	5								
Little River	2346	10/25/09	Redding		x			x								2	x	x	x			x	x	5								
Little River	2769	10/25/09	Redding													0	x	x	x	x		x	x	6								
Little River	2795	9/11/09	Canterbury		x	x		x		x						4	x	x		x		x		4								
Mashamoquet Brook	1164	9/18/09	Pomfret			x		x			x		x	x		5	x	x						2								
Mashamoquet Brook	1541	9/18/09	Pomfret		x	x		x			x			x		5	x	x		x		x		4								
Mill Brook	2430	10/17/09	Woodstock		x											1	x		x	x		x		4							x	1
Mill Brook	2793	10/24/09	Woodstock					x		x	x		x			4	x	x	x	x		x	x	6								
Morgan Brook	2273	9/26/09	Barkhamsted		x			x			x					3	x	x	x			x		4							x	1
Mount Hope River	2791	9/19/09	Ashford		x	x		x					x			4	x	x	x	x		x	x	6								
Natchaug River	1319	9/12/09	Eastford		x	x		x								3	x		x	x	x			4				x			x	2
Neck River	847	9/5/09	Madison					x			x		x			3	x	x	x	x		x	x	6	x		x					2
Nod Brook	1243	9/12/09	Avon										x			1	x	x	x			x	x	5								
Nonewaug River	230	10/4/09	Woodbury	x	x			x			x					4	x	x	x	x	x			5	x						x	2
Nonewaug River	770	10/9/09	Woodbury		x			x			x		x			4		x	x	x		x		4							x	1
Patagansett River	615	9/19/09	East Lyme													0	x		x	x				3	x							1
Pomperaug River	1313	10/2/09	Southbury	x				x			x		x			4	x	x	x	x		x		5	x							1
Pomperaug River	1990	10/9/09	Woodbury		x			x			x		x	x		5	x	x	x	x		x	x	6	x		x				x	3
Pomperaug River	5936	9/20/09	Southbury					x			x		x			3	x	x		x		x		4	x						x	2
Pond Brook	1523	10/16/09	Newtown		x			x				x	x			4	x	x	x	x		x		5	x			x				2
Pond Brook	2766	10/16/09	Newtown		x			x			x		x			4	x	x	x	x		x		5	x						x	2
Pootatuck River	281	10/16/09	Newtown	x				x	x		x					4	x	x				x	x	4	x			x			x	3
Pootatuck River	1198	10/16/09	Newtown					x			x	x	x			4	x	x		x				3								
Poplar Swamp Brook	5937	9/12/09	Farmington										x			1	x	x					x	3		x						1
Quinebaug River	5776	9/20/09	Sturbridge		x			x								2	x	x	x		x		x	5							x	1
Railroad Brook	1176	11/8/09	Vernon													0	x					x	x	3		x				x	x	3
Ratlum Brook	1512	9/26/09	New Hartford					x								1	x		x			x	x	4								
Salmon Brook	310	10/31/09	East Granby	x				x	x	x	x		x	x		7	x	x	x	x		x	x	6		x		x	x	x	x	5
Saugatuck River	320	10/24/09	Westport		x			x								2	x	x	x		x			4							x	1
Saugatuck River	1294	10/24/09	Weston		x								x			2	x	x	x				x	4	x							1

Saugatuck River	1296	10/24/09	Weston		x								x			2			x			x	x	3	x						1
Saugatuck River	2771	10/25/09	Redding		x											1	x	x	x					3		x						1
Shepaug River	325	5/30/09	Roxbury		x	x		x					x			4	x		x			x	x	4				x				1
Shepaug River		10/10/09	Roxbury	x	x			x		x	x			x		6	x	x	x	x			x	5								
Shepaug River	1037	10/22/09	Washington		x			x		x	x			x	x	6	x			x		x	x	4								
Shepaug River	1839	6/8/09	Washington		x	x					x			x		4	x		x				x	3								
Shepaug River	5599	10/10/09	Roxbury		x			x				x	x			4	x		x	x		x	x	5				x			x	2
Shepaug River	6023	5/30/09	Washington	x	x			x					x	x		5	x		x	x			x	4				x				1
Shepaug River		10/10/09	Washington	x	x			x		x	x	x		x		7	x			x				2								
Shepaug River	6025	6/8/09	Litchfield		x	x		x			x		x	x		6	x		x				x	3							x	1
Shepaug River	6071	10/22/09	Washington		x			x					x			3		x	x			x	x	4								
Shewville Brook	5607	11/8/09	Preston					x					x	x		3	x		x			x	x	4	x	x						2
South Branch Trout Brook	5938	9/12/09	West Hartford													0	x							1			x	x	x			3
South Branch Trout Brook	5939	9/12/09	West Hartford													0	x							1			x	x			x	3
Sprain Brook	2772	10/9/09	Woodbury		x			x				x	x			4	x	x	x			x	x	5								
Spring Lot Brook	5623	9/7/09	Westbrook					x								1	x	x	x			x	x	5	x		x	x				3
Spring Lot Brook	5940	9/7/09	Westbrook					x								1	x	x				x	x	4	x							1
Still River	1658	10/23/09	Woodstock		x			x			x					3	x	x	x	x			x	5					x			1
Still River	1796	9/26/09	Barkhamsted		x			x		x	x		x			5	x	x		x		x		4				x				1
Tankerhoosen River	344	10/10/09	Vernon					x								1	x	x	x	x				4								
Tankerhoosen River	345	10/10/09	Vernon					x	x				x			3	x	x				x	x	4								
Tankerhoosen River	1120	10/10/09	Vernon					x	x		x		x			4	x	x	x			x	x	5							x	1
Tankerhoosen River	1121	10/10/09	Vernon					x								1	x	x	x					3								
Tannery Brook	5947	10/25/09	Redding													0	x							1							x	1
Transylvania Brook	597	9/20/09	Southbury		x			x					x			3	x	x	x				x	4				x	x			2
Tributary to Eight Mile River (PV brook)	1238	4/25/09	Lyme			x	x	x		x						4	x	x	x			x	x	5	x				x	x		3
Tributary to Eight Mile River (PV brook)		10/31/09	Lyme					x								1	x	x	x			x	x	5				x				1

Tributary to Trout Brook	5941	9/12/09	West Hartford					x					x			2	x	x	x	x				4				x			x	2
Tributary to West River	5948	9/30/09	Guilford													0	x			x				2	x	x						2
Trout Brook	5942	9/12/09	West Hartford													0	x	x	x				x	4	x						x	2
Umpawaug Pond Brook	2241	10/25/09	Redding		x			x					x			3	x	x	x			x	x	5							x	1
Weekepeemee River	1468	10/4/09	Woodbury		x		x	x			x			x		5		x	x	x		x	x	5				x				1
West Branch Saugatuck River	1287	10/24/09	Weston		x											1	x	x	x			x	x	5								
West Branch Saugatuck River	1288	10/24/09	Westport		x											1	x	x	x	x				4	x							1
West Branch Saugatuck River	1999	10/24/09	Weston		x											1	x	x	x			x		4						x	x	2
West Branch Saugatuck River	5943	10/24/09	Weston		x			x								2		x	x			x		3								
West Redding Brook	5946	10/25/09	Danbury					x								1		x	x				x	3								
West River	2517	9/29/09	Guilford					x								1	x	x				x	x	4								
Wood Creek	5944	9/25/09	Bethlehem					x					x			2	x	x						2				x	x			2
Yantic River	622	10/12/09	Norwich		x			x			x					3	x	x	x	x		x		5					x		x	2

“4 or MORE”

WPLR use of the RBV data for aquatic life use support assessments = "4 or more types of the most wanted category":

The distribution of most wanted types in the 121 samples was 0 to 6 for spring 2009 and 0 to 7 for fall 2009 (Table 1 and Figure 3). Thirty-two of the fall 2009 voucher samples had 4 or more types in the most wanted category (Table 2) while 22 voucher samples just missed the “4” criteria by a single most wanted type (Table 3).

Table 2. Thirty-two of the 2009 RBV voucher samples contained 4 or more “Most Wanted” types. The data are sorted alphabetically by stream name.

Stream	ADB segment	station id	Municipality	landmark	date	most wanted
Blackberry River		5961	North Canaan	Under bridge, 100 yards DS of Beckley Blast Furnace Dam	11/2/2009	**5**
Cherry Brook	CT4309-00_01	1513	Canton	Route 44	9/26/2009	**4**
Cranberry Meadow Brook		5153	East Lyme	50 M DS of rte 161	9/19/2009	**4**
Deep Brook	CT6019-00_01	47	Newtown	near Pootatuck River	10/16/2009	**4**
East Branch Salmon Brook	CT4320-00_01	2454	Granby	Wells Road Bridge	10/10/2009	**6**
French Brook	CT4707-02_01	1534	Bolton	French Road	11/8/2009	**4**
Halfway River		2762	Newtown	Jordan Hill Road	11/8/2009	**4**
Hammonasset River	CT5106-00_01	96	Madison	Summer Hill Road	9/5/2009	**4**
Little River	CT3708-00_01	1063	Putnam	Murphy Park (town swimming area)	10/9/2009	**4**
Little River	CT3805-00_04	1655	Canterbury	between bridge crossing and Goodwin Road	10/10/2009	**5**
Little River		2795	Canterbury	off Little River lane	9/11/2009	**4**
Mashamoquet Brook	CT3710-00_02	1164	Pomfret	Route 44 in State Park	9/18/2009	**5**
Mashamoquet Brook	CT3710-00_02	1541	Pomfret	paved section of road in state park	9/18/2009	**5**
Mill Brook		2793	Woodstock	Route 171 near Sprucedale Gardens	10/24/2009	**4**
Mount Hope River		2791	Ashford	Route 44	9/19/2009	**4**
Nonewaug River	CT6802-00_01	230	Woodbury	Route 47 (Washington Road)	10/4/2009	**4**
Nonewaug River	CT6802-00_01	770	Woodbury	Minortown road adjacent to Mill Road	10/9/2009	**4**
Pomperaug River	CT6800-00_01	1313	Southbury	off Flagg Swamp Road	10/2/2009	**4**
Pomperaug River	CT6800-00_04	1990	Woodbury	town park (the Hollow) off Rte 317	10/9/2009	**5**

Pond Brook		1523	Newtown	Bridge at State Boat Launch	10/16/2009	**4**
Pond Brook		2766	Newtown	Intersection of Pond Brook Rd and Obtuse Rd	10/16/2009	**4**
Pootatuck River	CT6020-00_02	281	Newtown	Wasserman Way on Game Club Property (Mile Hill Rd)	10/16/2009	**4**
Pootatuck River	CT6020-00_01	1198	Newtown	Tom's Brook Confluence (DS STP outfall)	10/16/2009	**4**
Salmon Brook	CT4320-00_01	310	East Granby	Granbrook Park	10/31/2009	**7**
SHEPAUG RIVER	CT6700-00_01	325	Roxbury	Wellers Bridge Road (Route 67)	10/10/2009	**6**
SHEPAUG RIVER	CT6700-00_01	1037	Washington	Steep Rock park at river road bridge, tunnel road, or lower church hill	10/22/2009	**6**
SHEPAUG RIVER		5599	Roxbury	At Hodge Park	10/10/2009	**4**
SHEPAUG RIVER		6023	Washington	1.11 miles US of Judds Bridge Rd at Steep Rock Preserve	10/10/2009	**7**
Sprain Brook		2772	Woodbury	Route 47 adjacent to Papermill Road	10/9/2009	**4**
Still River	CT4303-00_01	1796	Barkhamsted	Route 20	9/26/2009	**5**
Tankerhoosen River	CT4503-00_02	1120	Vernon	Bolton Road	10/10/2009	**4**
Weekepeemee River	CT6804-00_01	1468	Woodbury	Jacks Bridge Road at USGS gage	10/4/2009	**5**

Table 3. Twenty-two of the 2009 RBV voucher samples contained 3 "Most Wanted" types. Data are sorted by stream name.

Stream	ADB segment	station id	Municipality	landmark	date	**most wanted**
Aspetuck River	CT7202-00_02	2480	Easton	Silver Hill Road	10/25/2009	**3**
Aspetuck River	CT7202-00_02	2481	Easton	Valley Road pull-off and trail head	10/25/2009	**3**
Beaver Brook	CT4803-00_01	1236	Lyme	bridge at 55-123 Beaver Brook Road	10/31/2009	**3**
Bradley Brook		6067	Middlebury	South Street near Bridle Trail	10/25/2009	**3**
Broad Brook	CT3716-00_01	1841	Preston	Route 164	10/10/2009	**3**
Burnhams Brook		1239	East Haddam	Mouth	10/31/2009	**3**
East Spring Brook		5932	Bethlehem	Nonewaug Road and Porter Hill road	9/30/2009	**3**
Fenton River	CT3207-00_02	74	Willington	Daleville Road	11/16/2009	**3**
Fourmile River		5933	East Lyme	spring rock road	9/19/2009	**3**
Gages Brook	CT4503-01_01	1240	Tolland	footbridge on Tolland	10/10/2009	**3**

				Agricultural Center Property		
Harris Brook	CT4801-00_01	1237	Salem	Mouth	10/31/2009	**3**
Morgan Brook	CT4305-00_02	2273	Barkhamsted	Route 318	9/26/2009	**3**
Natchaug River	CT3200-00_02	1319	Eastford	Route 198 entrance to Natchaug SF	9/12/2009	**3**
Neck River	CT5107-00_01	847	Madison	Warpus Road	9/5/2009	**3**
Pomperaug River		5936	Southbury	Flood Bridge Road	9/20/2009	**3**
SHEPAUG RIVER		6071	Washington	Valley Road Pull off just upstream of Route 202	10/22/2009	**3**
Shewville Brook		5607	Preston	above pond in Lincoln park	11/8/2009	**3**
Still River	CT3202-00_02	1658	Woodstock	downstream of upper crossing	10/23/2009	**3**
Tankerhoosen River	CT4503-00_02	345	Vernon	Tunnel Road	10/10/2009	**3**
Transylvania Brook	CT6806-00_01	597	Southbury	Whale Road	9/20/2009	**3**
Umpawaug Pond Brook		2241	Redding	Simpaug Turnpike at RR crossing	10/25/2009	**3**
Yantic River	CT3900-00_01	622	Norwich	West Town Street adjacent to Connecticut Avenue	10/12/2009	**3**

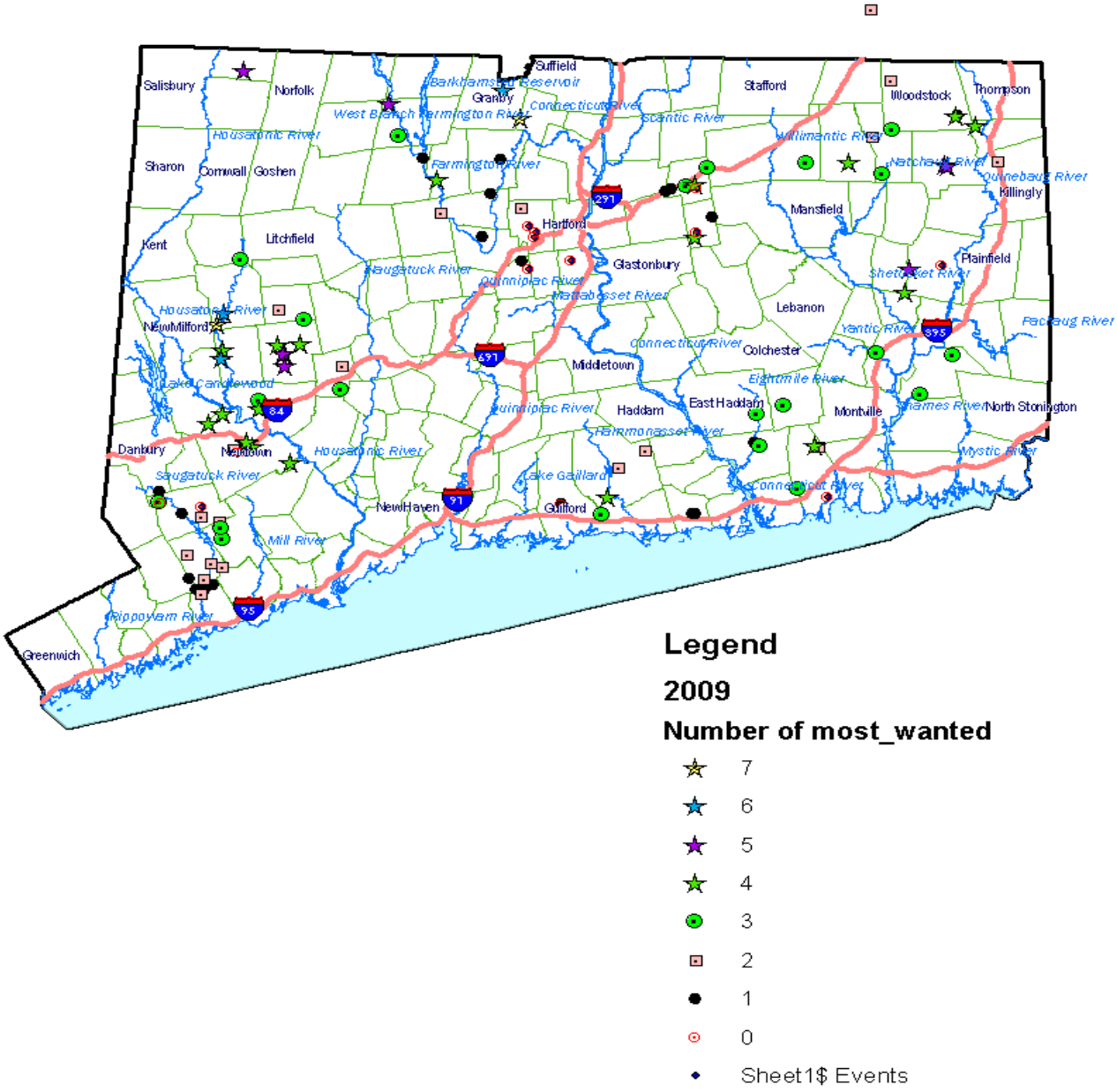


Figure 3. The number of most wanted types present in voucher samples submitted to WPLR collected in fall 2009. Fall samples with 4 or more indicate full support of ALUS goals. Site numbers can be cross-referenced with Table 2 or Appendix A.

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Barbour, M.T., J. Gerritsen, B.D. Synder, and J.B. Stribling. 1999. Rapid Bioassessment in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish. Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.
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Additional links with relevant information

USEPA volunteer monitoring: http://www.epa.gov/OWOW/monitoring/vol.html

USEPA biological monitoring: http://www.epa.gov/bioindicators/html/invertebrate.html

USGS water resources data for Connecticut: http://ct.water.usgs.gov/

Appendix A. The following provides a description of the location where an RBV sample was collected during 2009. Locations are sorted alphabetically by stream name.

Stream	proximity	landmark	basin id	Municipality	station id	ADB segment	YLat	XLong
Aspetuck River	adjacent	Valley Road pull-off and trail head	7202	Easton	2481	CT7202-00_02	41.2771	-73.3275
	at	Judges Hollow Road	7202	Fairfield	2479	CT7202-00_01	41.2132	-73.3291
		Silver Hill Road	7202	Easton	2480	CT7202-00_02	41.2589	-73.3247
	upstream	Bayberry Lane	7202	Westport	1	CT7202-00_01	41.1864	-73.3429
		Confluence with Saugatuck River at Lyons Plain Rd	7202	Westport	1299	CT7202-00_01	41.1769	-73.3579
		Rock House Road at nature preserve	7202	Easton	2482	CT7202-00_02	41.2865	-73.3327
Ball Pond Brook	DS Ball Pond road East	at outlet	6402	New Fairfield	5930		41.4651	-73.5190
	upstream	Meadow Brook Road	6402	New Fairfield	5931		41.4703	-73.5101
	At	Route 37	6402	New Fairfield	1096		41.4677	-73.4882
Bass Brook	DS	Stanley Park access road	4401	New Britain	5945		41.7074	-72.7734
		Route 175 crossing	4401	Newington	2662		41.6931	-72.7587
Beaver Brook	downstream	bridge at 55-123 Beaver Brook Road	4803	Lyme	1236	CT4803-00_01	41.4100	-72.3289
BIGELOW BROOK		US of Ashford rd	3203	Eastford	5066		41.9042	-72.1192
Blackberry River		Under bridge, 100 yards DS of Beckley Blast Furnace Dam	6100	North Canaan	5961		42.0108	-73.2929
Blackledge River	500 DS Downstream	Deming Road	4707	Bolton	1248	CT4707-00_01	41.7518	-72.4454
Bolton Pond Brook	at	Mark Anthony Lane	3108	Bolton	2486		41.7784	-72.4167
Bradley Brook	at	South Street near Bridle Trail	6917	Middlebury	6067		41.5005	-73.1078
Broad Brook	at	Route 164	3716	Preston	1841	CT3716-00_01	41.5538	-71.9703
Bunnell Brook	between	Punch Brook confluence and	4311	Burlington	2266	CT4311-00_01	41.7833	-72.9247

		Route 179						
Burnhams Brook	at	Mouth	4800	East Haddam	1239		41.4603	-72.3343
Chatfield Hollow Brook	at	covered bridge in state park	5105	Killingworth	1998		41.3742	-72.5930
Cherry Brook	upstream	Route 44	4309	Canton	1513	CT4309-00_01	41.8365	-72.9295
Cranberry Meadow Brook		50 M DS of rte 161	2202	East Lyme	5153		41.4081	-72.2289
Deep Brook	at	Baldwin Road	6019	Newtown	1992	CT6019-00_01	41.4029	-73.3079
	DS	old bridge crossing DS Wassermann way	6019	Newtown	1993	CT6019-00_01	41.4023	-73.2947
	upstream	Bushy Hill Road in Dickenson park	6019	Newtown	2473		41.3976	-73.3006
		Route 25	6019	Newtown	2280	CT6019-00_01	41.3977	-73.2946
	upstream mouth	near Pootatuck River	6019	Newtown	47	CT6019-00_01	41.4131	-73.2823
East Branch Salmon Brook	DS	Wells Road Bridge	4320	Granby	2454	CT4320-00_01	41.9813	-72.8066
East Spring Brook	at	Nonewaug Road and Porter Hill road	6801	Bethlehem	5932		41.6121	-73.1761
Fenton River	adjacent	Daleville Road	3207	Willington	74	CT3207-00_02	41.8630	-72.2402
Fivemile River	at	Route 12 and Huntley Road on town property	3400	Killingly	2462	CT3400-00_03	41.8638	-71.8834
Folly brook	at blue trail crossing	Wintergreen Woods off folly brook blvd	4005	Wethersfield	6070		41.7080	-72.6798
Fourmile River	at	spring rock road	2207	East Lyme	5933		41.3390	-72.2592
French Brook	at	French Road	4707	Bolton	1534	CT4707-02_01	41.7442	-72.4485
Gages Brook	at	footbridge on Tolland Agricultural Center Property	4503	Tolland	1240	CT4503-01_01	41.8571	-72.4248
Halfway River	at	Jordan Hill Road	6022	Newtown	2762		41.3811	-73.2010
Hammonasset River	upstream	Summer Hill Road	5106	Madison	96	CT5106-00_01	41.3278	-72.6116
Harris Brook	at	Mouth	4801	Salem	1237	CT4801-00_01	41.4733	-72.2851

Heft Brook	downstream	Parker Hill Road	5103	Killingworth	5934		41.4022	-72.5440
Hop Brook	200 feet downstream	Route 188 bridge near firehouse	6916	Middlebury	2470		41.5377	-73.1075
		Below old mill pond adj. Waterfall Way	4318	Simsbury	1015	CT4318-00_01	41.8701	-72.8106
Kitt Brook	at	Route 14	3714	Canterbury	1967		41.6967	-71.9899
Latimer Brook	behind	St Mathias Church	2202	East Lyme	5935		41.4073	-72.2217
Lebanon Brook	upstream	Route 198, North of 198/197 intersection	3705	Woodstock	2272		41.9945	-72.0836
Little River	50 m US dam	Murphy Park (town swimming area)	3708	Putnam	1063	CT3708-00_01	41.9208	-71.9228
	adjacent Ulasick Road	between bridge crossing and Goodwin Road	3805	Canterbury	1655	CT3805-00_04	41.6916	-72.0489
	at	Cross Highway	7201	Redding	2769		41.3090	-73.3658
		Newtown Turnpike	7201	Redding	2346		41.2931	-73.3678
	at old bridge fishing access	off Little River lane	3805	Canterbury	2795		41.6547	-72.0569
Mashamoquet Brook	500 meters DS	Route 44 in State Park	3710	Pomfret	1164	CT3710-00_02	41.8579	-71.9812
	end	paved section of road in state park	3710	Pomfret	1541	CT3710-00_02	41.8561	-71.9758
Mill Brook	at	Route 171 near Sprucedale Gardens	3707	Woodstock	2793		41.9375	-71.9595
		Stone Bridge Rd	3707	Woodstock	2430	CT3707-00	41.9401	-71.9573
Morgan Brook	upstream	Route 318	4305	Barkhamsted	2273	CT4305-00_02	41.9086	-73.0007
Mount Hope River	250 feet downstream	Route 44	3206	Ashford	2791		41.8633	-72.1612
Natchaug River	at	Route 198 entrance to Natchaug SF	3200	Eastford	1319	CT3200-00_02	41.8458	-72.0976
Neck River	at	Warpus Road	5107	Madison	847	CT5107-00_01	41.2987	-72.6235
Nod Brook	DS	Route 10	4317	Avon	1243	CT4317-00_01	41.8158	-72.8294

Nonewaug River	downstream	Route 47 (Washington Road)	6802	Woodbury	230	CT6802-00_01	41.5575	-73.2122
	upstream	Minortown road adjacent to Mill Road	6802	Woodbury	770	CT6802-00_01	41.5728	-73.1844
Patagansett River	at	Brook Lane	2205	East Lyme	615	CT2205-00_01	41.3262	-72.2054
Pomperaug River	adjacent Bent-Of-River Audubon Center	off Flagg Swamp Road	6800	Southbury	1313	CT6800-00_01	41.4672	-73.2580
	at	Flood Bridge Road	6800	Southbury	5936		41.4690	-73.2298
		town park (the Hollow) off Rte 317	6800	Woodbury	1990	CT6800-00_04	41.5365	-73.2136
Pond Brook	300 meters downstream	Intersection of Pond Brook Rd and Obtuse Rd	6018	Newtown	2766		41.4433	-73.3545
	at	Bridge at State Boat Launch	6018	Newtown	1523		41.4597	-73.3275
Pootatuck River	adjacent	Tom's Brook Confluence (DS STP outfall)	6020	Newtown	1198	CT6020-00_01	41.4149	-73.2827
	downstream	Wasserman Way on Game Club Property (Mile Hill Rd)	6020	Newtown	281	CT6020-00_02	41.4064	-73.2720
Poplar Swamp Brook	at Trout Pond outlet	Winding Trails	4300	Farmington	5937		41.7465	-72.8446
Quinebaug River	at	Holland Road	3700	Sturbridge	5776		42.1097	-72.1186
Railroad Brook	at footbridge	In Valley Falls St. Park, Northern end of Freja Park	4503	Vernon	1176		41.8242	-72.4454
Ratlum Brook	downstream	Farmington River Turnpike at mouth	4308	New Hartford	1512	CT4308-18_01	41.8723	-72.9561
Salmon Brook	adjacent	Granbrook Park	4320	East Granby	310	CT4320-00_01	41.9366	-72.7749
Saugatuck River	at	DS end of Fly Fishing Only Area (1 Ford Rd)	7200	Westport	320	CT7200-00_01	41.1693	-73.3670
		Keene Park Parking Lot	7200	Weston	1294	CT7200-00_02	41.1927	-73.3617
		Lyons Plain Road at Fire Station	7200	Weston	1296	CT7200-00_02	41.2199	-73.3499
	behind Mark	downstream Diamond Hill Road	7200	Redding	2771		41.2994	-73.4016

	Twain Library	and Rte 53						
SHEPAUG RIVER	500 meters Downstream	Rte 202 adjacent to dirt road	6700	Washington	1839	CT6700-00_02	41.7019	-73.2904
	at	Valley Road Pull off just upstream of Route 202	6700	Washington	6071		41.7089	-73.2944
	downstream 100 meters	Wellers Bridge Road (Route 67)	6700	Roxbury	325	CT6700-00_01	41.5489	-73.3308
	in	Steep Rock park at river road bridge, tunnel road, or lower church hill	6700	Washington	1037	CT6700-00_01	41.6220	-73.3255
		1.11 miles US of Judds Bridge Rd at Steep Rock Preserve	6700	Washington	6023		41.6027	-73.3380
		At Hodge Park	6700	Roxbury	5599		41.5631	-73.3278
		below lower Shepaug dam	6700	Litchfield	6025		41.7185	-73.2928
Shewville Brook		above pond in Lincoln park	3003	Preston	5607		41.4897	-72.0297
South Branch Trout Brook	between	South Main Street and Sedgwick Road	4403	West Hartford	5938		41.7536	-72.7449
	DS	Elmfield Road	4403	West Hartford	5939		41.7454	-72.7498
Sprain Brook	downstream	Route 47 adjacent to Papermill Road	6803	Woodbury	2772		41.5696	-73.2259
SPRING LOT BROOK	US	Westbrook HS athletic field access road off McVeagh Road	5102	Westbrook	5940		41.3011	-72.4517
		Off McVeaugh Rd US access Rd for town dump	5102	Westbrook	5623		41.3019	-72.4569
Still River	adjacent to Route 198	downstream of upper crossing	3202	Woodstock	1658	CT3202-00_02	41.9158	-72.0774
	upstream	Route 20	4303	Barkhamsted	1796	CT4303-00_01	41.9600	-73.0200
Tankerhoosen River	DS	Bolton Road	4503	Vernon	1120	CT4503-00_02	41.8294	-72.4482
	upstream	Tunnel Road	4503	Vernon	345	CT4503-00_02	41.8272	-72.4640

	upstream 100 m	mouth at golf land	4503	Vernon	344	CT4503-00_01	41.8201	-72.5033
	US	Small pond (below dobsonville pond)	4503	Vernon	1121	CT4503-00_01	41.8232	-72.4934
Tannery Brook	eastern crossing	Gallows Hill Road		Redding	5947		41.3147	-73.4401
Transylvania Brook	25 meters downstream	Whale Road	6806	Southbury	597	CT6806-00_01	41.4826	-73.2595
Tributary to Eight Mile River (PV brook)	at	trail crossing off MacIntosh Road	4800	Lyme	1238	CT4800-15_01	41.4155	-72.3396
Tributary to Trout Brook	DS	Winchester Road	4403	West Hartford	5941		41.7913	-72.7747
Tributary to West River	at	Flat Meadow Road, just west of West River	5110	Guilford	5948		41.3144	-72.6980
Trout Brook	DS	Whitman Ave.	4403	West Hartford	5942		41.7634	-72.7600
Umpawaug Pond Brook	adjacent to	Simpaug Turnpike at RR crossing	7200	Redding	2241		41.3169	-73.4443
Weekepeemee River	downstream	Jacks Bridge Road at USGS gage	6804	Woodbury	1468	CT6804-00_01	41.5575	-73.2155
West Branch Saugatuck River	at	Cavalry Road	7203	Weston	1287	CT7203-00_01	41.1780	-73.3742
		Godfrey Road	7203	Weston	5943		41.2331	-73.3934
		Stonebridge Road in Open Space Property	7203	Weston	1999	CT7203-00_01	41.1947	-73.3875
	at mouth	Glendenning Parking Lot	7203	Westport	1288	CT7203-00_01	41.1718	-73.3643
West Redding Brook	behind	West Redding Library off Long Ridge Road		Danbury	5946		41.3343	-73.4428
West River	upstream	Flat Meadow Road	5100	Guilford	2517	CT5110-00_02	41.3167	-72.6976
Wood Creek	at	Route 132	6804	Bethlehem	5944		41.6275	-73.2257
Yantic River	upstream	West Town Street adjacent to Connecticut Avenue	3900	Norwich	622	CT3900-00_01	41.5583	-72.1120

RAPID BIOASSESSMENT IN WADEABLE STREAMS AND RIVERS BY VOLUNTEER MONITORS
FIELD DATA SHEET

SUBMIT DATA TO: MIKE BEAUCHENE (mike.Beauchene@po.state.ct.us)
PHONE (860) 424-4185

WATERBODY NAME:		COLLECTION DATE:	COLLECTION TIME:
LOCATION DESCRIPTION:		COLLECTORS NAMES:	
TOWN:	NOTES/COMMENTS:		

	1	2	3	4	5A	5 B	5 C
MOST	Body builder mayfly	Minnow mayfly	2-tailed flat head mayfly	Roach-like stonefly	Common stonefly	Giant stonefly	Misc
	Drunella	Isonychia	Epeorus	Peltoperlidae	Perlidae	Pteronarcys	Stonefly
							
Locs 1&2							
Locs 3&4							
Locs 5&6							

	6A	6 B	7	8A	8 B
MOST	Saddle-Case caddis	Cornucopia Case caddis	Michelin Man caddis	Mid-size plant case caddis	
	Glossosoma	Apatania	Rhyacophila	Brachycentrus	Lepidostoma
					
Locs 1&2					
Locs 3&4					
Locs 5&6					

DATA INTERPRETATION	
# OF TYPES OF THE "MOST"	WATER QUALITY
5 OR MORE	EXCEPTIONAL
3 TO 4	EXCELLENT
1 TO 3	VERY GOOD
0	MORE INFO NEEDED TO ASSESS

	9	10	11	12	13 A	13 B	14
MODERATE	Common net-spinner	Fingernet Caddis	Flat Head mayfly	Water Penny	Dobsonfly	Fishfly	Dragonfly & Damselfly
	Hydropsychidae	Chimarra	Stenonema	Psephenus	Corydalus	Nigronia	Odonata
							
Locs 1&2							
Locs 3&4							
Locs 5&6							

	15 A	15 B	15 C	15 D	15 E	15 F	15 G
LEAST	Amphipod	Isopod	Leech	Midge	Black fly	Snail	Worm
							
Locs 1&2							
Locs 3&4							
Locs 5&6							

	OTHER COMMONLY COLLECTED RIFFLE-DWELLING MACROINVERTEBRATES						
OTHERS	Crayfish	Crane fly larvae	Riffle Beetle adult/larva	Small minnow mayfly	Water snipe fly	Planaria	Fingernail clam/ mussel
							
Present							

ALL RBV MATERIALS ARE AVAILABLE AT: http://dep.state.ct.us/wtr/volunmon/volopp.htm

PLEASE NOTE: BE SURE TO INCLUDE AT LEAST 1 OR 2 OF EACH ORGANISM IN YOUR VOUCHER COLLECTION!! INCLUDE A SPECIMEN FROM EVERY TYPE YOU THINK IS A DIFFERENT, EVEN IF IT IS NOT PICTURED ON THIS DATASHEET. **IF AN ORGANISM IS NOT INCLUDED IN THE VOUCHER COLLECTION IT WILL NOT BE INCLUDED IN THE FINAL DATA ASSESSMENT!!**